

Appl. No. 10/697,312

Amendments to the Drawings:

Sheets 1 of 7 to 5 of 7 and 7 of 7 have been amended.

The amendment to the Figures includes the addition of a redundant switching portion.

Attachment: Replacement Sheets
Annotated Sheets Showing Changes

Appl. No. 10/697,312

REMARKS/ARGUMENTS

Status of Claims

Claims 1 to 6, 14 to 18 and 29 remain in the application. Claims 25 to 28 have been cancelled from the application. Claims 7 to 13, 19 to 24, 30 and 31 are withdrawn.

Amendments to Drawings

Figures 1 to 5 and 7 have been amended to show that Photonic Switching Fabric 50 includes a redundant switching portion 51.

Amendments to Specification

A minor editorial correction has been made in the specification for consistency with the amendments made to the Figures by replacing the paragraph starting on p. 8, line 16.

Amendments to Claims

Claim 1 has been amended to recite

“A method of protecting any one of a plurality of optical signals of a multi-wavelength optical signal from failure of ~~an optical component~~ a photonic switching fabric the method comprising:

optically splitting the multi-wavelength optical signal to obtain a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals;

detecting a failure in the ~~optical component~~ photonic switching fabric which would affect a particular optical signal of the plurality of optical signals;

redirecting the protection portion of the multi-wavelength optical signal around the ~~optical component~~ failure in the photonic switching fabric ~~the protection portion of the multi-wavelength optical signal~~; and

Appl. No. 10/697,312

after the redirecting step has been completed, wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of the particular optical signal”,

where the underlined text has been added to the claim and the strikethrough text has been cancelled from the claim. Claim 14 has been amended in a similar manner. The text of the “redirecting” step has been rearranged for ease of understanding.

Claim 2 has been amended to recite “A method according to claim 1 wherein the ~~optical component~~ photonic switching fabric comprises a dedicated switching fabric portion and a redundant switching fabric portion, and the step of redirecting comprises inputting the protection portion of the multi-wavelength optical signal through ~~a spare~~ the redundant switching fabric portion”, where the underlined text has been added to the claim and the strikethrough text has been cancelled from the claim.

Claim 15 has been amended to recite “wherein the redirecting means comprising a protection optical waveguide for inputting the protection portion of the multi-wavelength optical signal through a spare redundant switching fabric portion, and wherein the ~~optical component~~ photonic switching fabric comprises a dedicated switching fabric portion”. Amended claim 15 also recites “redirecting means coupled to the optical splitter for redirecting the protection portion of the multi-wavelength optical signal around the ~~optical component~~ detected failure of the photonic switching fabric ~~the protection portion of the multi-wavelength optical signal~~”, where the underlined text has been added to the claim and the strikethrough text has been cancelled from the claim.

Claim 29 has been amended to recite “a detected failure of a dedicated switching fabric portion of a photonic switching fabric, the egress trunk line card comprising: redirecting means for redirecting a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals around the dedicated switching fabric portion ~~a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals~~”, where the underlined text has been added to the claim and the strikethrough text has been cancelled from the claim.

Appl. No. 10/697,312

In claims 4, 6, 15, 16, 18 and 29, the expression "dedicated switching fabric" has been replaced with "dedicated switching fabric portion".

Objection to Drawings

The Examiner has objected to the drawing under 37 CFR 1.83(a) for failing to show every feature of the invention specified in the claims. Based on amendments made to the claims to clarify that the formerly recited optical component is now recited to be a photonic switching fabric including a redundant switching fabric portion, and amendments to the drawings illustrating this portion, Applicant submits that the drawings show the features of the invention specified in the claims. Applicant respectfully requests that the Examiner reconsider and withdraw the objection.

35 U.S.C 112 Claim Rejections

The Examiner rejects claims 1 to 6, 14 to 18 and 25 to 29 under 35 U.S.C. 112 for failing to comply with the enablement requirement.

Amendments have been made to the claims as described above to more clearly define the scope of the claims. The term "optical component" has been replaced with the term "a photonic switching fabric" and the expression "through a spare switching fabric" in claim 2 has been replaced with the expression "through a redundant switching fabric portion". These amendments are supported by the specification at page 8, lines 16-23, page 10, lines 15-21 and page 13, lines 4-17. At page 9, lines 12-17 of the present application it is disclosed that the dedicated switching fabric portion and spare (redundant) switching fabric portion can be separate switching fabrics or a single integrated switching fabric. Based on the recitation in amended claim 1 of "redirecting the protection portion of the multi-wavelength optical signal around the failure in the photonic switching fabric", Applicant submits that it is clear that the protection portion is being redirected around only a portion of the overall photonic switch fabric and the redirecting occurs within the photonic switching fabric, in particular, as recited in amended claim 2, via the redundant switching fabric portion.

Appl. No. 10/697,312

The Examiner also rejects claims 1 to 6, 14 to 18 and 25 to 29 under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. As discussed above, the amended claims now clearly recite that the "redirecting" step occurs by redirecting the protection portion of the multi-wavelength optical signal around a dedicated switching fabric portion of the photonic switching fabric.

Applicant submits that in view of amendments made to the claims, which are fully supported by the specification, and amendments to the drawings, claims 1 to 6, 14 to 18 and 29 comply with the enablement requirement and distinctly claim the invention. Applicant respectfully requests that the Examiner reconsider and withdraw the two 35 U.S.C. 112 rejections.

35 U.S.C 103 Claim Rejections

The Examiner has rejected claims 1 to 6, 14 to 18 and 25 to 29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,146,102 (Nishi et al, hereinafter Nishi).

The law on obviousness under 35 U.S.C. 103 was recently addressed in *KSR Int'l v. Teleflex, Inc.*, No. 04-1350, slip op. at 14 (U.S., Apr. 30, 2007). Following this, examination guidelines were released on October 10, 2007 in regards to determining obviousness under 35 U.S.C. 103. According to these guidelines, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in *Graham v. John Deere Co.* 383 U.S. 1,148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) Resolving the level of ordinary skill in the pertinent art.

The Graham factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis. Once the findings of fact are articulated, Office personnel must provide an explanation to support an obviousness rejection under 35 U.S.C. 103.

Appl. No. 10/697,312

Applicant's analysis below demonstrates that the Examiner has failed to properly conform to the aforementioned guidelines for a finding of obviousness under 35 U.S.C. 103.

Claim 1 recites a method for splitting a multi-wavelength optical signal, which includes a plurality of optical signals, to obtain a protection portion of the multi-wavelength optical signal, the protection portion including protection portions of each of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 11, line 1 to page 12, line 2. A further step involves redirecting around the optical component the protection portion including the protection portions of each of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 13, lines 4 to 17. A further step involves wavelength filtering the protection portion to obtain the protection portion of a particular optical signal of the plurality of optical signals. An example of this is described with regard to Figure 1 on page 15, line 20 to page 16, line 10. Amended claim 1 now recites that wavelength filtering to obtain the protection portion of the particular optical signal is performed "after the redirecting step has been completed".

At column 14, lines 37 to 41 Nishi discloses:

"When, in the input circuit described above, an arbitrary optical signal λ_x of a plurality of optical signals λ_1 through λ_n is not input due to some failure, the wavelength selector 64 selects an optical signal with wavelength λ_x from the WDM light and outputs the selected signal."

Applicant submits that what is disclosed by Nishi is different from what is claimed in amended claim 1. As opposed to disclosing redirecting a protection portion of signal that includes the entire content of an input WDM signal and obtaining a particular wavelength component from the protection portion by wavelength filtering, Nishi selects a wavelength component of a protection portion comprising the entire content of an input WDM signal and then redirects only that particular wavelength portion. Nishi discloses a set of input circuits 60-1...60-k that each are adapted to split a WDM signal and used one portion of the split signal as a protection portion of the WDM signal. However, Nishi discloses that wavelength selector 64 selects a single optical signal designated by the operating system having a wavelength λ_x and

Appl. No. 10/697,312

then provides this signal to the switch. This particular portion of the signal is then routed through a switch and combined with the original WDM signal, which has been routed through a switch. Nishi takes the deliberate step of selecting a protection portion of the signal prior to redirecting of the protection portion. Nishi does not suggest or disclose "redirecting the protection portion of the multi-wavelength optical signal around the dedicated switching fabric portion; and after the redirecting step has been completed, wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of the particular optical signal" as recited in amended claim 1.

On top of page 6 of the Office Action, the Examiner states that "the claims say that filtering is provided to obtain THE PROTECTION PORTION of the particular optical signal". The Examiner also states that Applicant's application discloses that the filtering can occur prior to or subsequent to the switching fabric. Applicant submits that the language used in the claims defines "a protection portion of the multi-wavelength optical signal" as "comprising protection portions of each of the optical signals". Presently amended claim 1 recites that the wavelength filtering occurs "after the redirecting step has been completed" and that the wavelength filtering is performed on the protection portion of the multi-wavelength optical signal, which includes protection portions of each of the optical signals, to obtain the protection portion of the particular optical signal. Therefore, amended claim 1 recites that all protection portions of the multi-wavelength optical signal are redirected around the dedicated switching fabric and the claim is limited to the condition of wavelength filtering after the redirection of the signal.

Figure 15 of Nishi and the accompanying description disclose that elements 71-1 to 71-n are fixed wavelength converters that "converts the wavelength of an optical signal from the optical switch 13 into a corresponding wavelength" (column 14, lines 47 to 49). Element 74 is a variable wavelength converter that "converts the wavelength of a supplied optical signal into a wavelength designated by the operating system" (column 14, lines 60 to 62). The fixed or variable wavelength converters in Nishi are disclosed as being used to convert a particular received wavelength into a corresponding wavelength. Applicant submits that wavelength filtering comprises selecting one or more particular wavelengths from a group of wavelengths in a given bandwidth. Applicant submits that the fixed or variable wavelength converters as disclosed in Nishi do not perform wavelength filtering as recited in claim 1. While it may be

Appl. No. 10/697,312

considered that wavelength selector 64 in Figure 15 of Nishi is a wavelength filter, this component is located prior to the redirecting step. Therefore, Nishi does not disclose wavelength filtering "after the redirecting step has been completed" as recited in amended claim 1.

As discussed above, the Graham factors include (1) determining the scope and content of the prior art; (2) ascertaining the differences between the claimed invention and the prior art; and (3) resolving the level of ordinary skill in the pertinent art. With regard to point (2), clearly there are differences between what is disclosed in Nishi and what is recited in the present claims of the application, in particular Nishi is silent on the possibility of "redirecting the protection portion of the multi-wavelength optical signal around the failure in the photonic switching fabric; and after the redirecting step has been completed, wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of the particular optical signal" as recited in amended claim 1. With regard to point (3), Applicant submits that Nishi should be considered as one who has a skill level that is at least that of one skilled in the art. Nishi discloses eleven different embodiments in the application, but none of them are as claimed in amended claim 1, in particular "redirecting the protection portion of the multi-wavelength optical signal around the failure in the photonic switching fabric; and after the redirecting step has been completed, wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of the particular optical signal". Applicant submits that if it was obvious to allow all of the protection portions to pass through the switching fabric and make the selection of a desired protection portion after the switching fabric, Nishi would have at least suggested this possibility, considering that Nishi would be considered as one skilled in the art.

Taking into consideration the Graham factors as defined above, Applicant submits that due to differences in what is recited in the Nishi and what is claimed in the present application, and since Nishi as one skilled in the art does not suggest or disclose what is recited in claim 1, Applicant submits that claim 1 is non-obvious with regard to and patentably distinguish over Nishi. It is submitted that the Examiner has failed to properly conform to the aforementioned guidelines for a finding of obviousness under 35 U.S.C. 103.

Appl. No. 10/697,312

Claim 14 is a device claim. Claim 14 recites similar subject matter to method claim 1. For at least the reasons discussed above with regard to claim 1, Applicant submits claim 14 patentably distinguishes over Nishi.

Claims 2 to 6 are dependent on claim 1 and claims 15 to 18 are dependent on claim 14. Applicant submits these claims are allowable for at least their dependence on independent claims 1 and 14.

Claims 25 to 28 have been cancelled from the application rendering the Examiner's application moot.

With regard to claim 29, the Examiner concedes that Nishi does not disclose an egress trunk line card per se, but further states that this limitation is found in the preamble and not given patentable weight. As discussed above with regard to the rejection of claim 1, Nishi discloses selecting a single wavelength signal from a plurality of wavelengths on the input side of a switching fabric, providing that single wavelength signal via a protection path to the switching fabric. Nishi does not disclose a tunable filter in any of output circuits 70-1 through 70-k. Applicant submits that Nishi discloses only a fixed or variable wavelength converter, which is not the same as a tunable optical filter as recited in claim 29.

For at least the above reasons, Applicant submits that Nishi does not disclose "redirecting a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals around the dedicated switching fabric " (emphasis added) or "a tunable optical filter coupled to the redirecting means for wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of a particular optical signal which would have been affected by the failure".

As discussed above, the Graham factors include (1) determining the scope and content of the prior art; (2) ascertaining the differences between the claimed invention and the prior art; and (3) resolving the level of ordinary skill in the pertinent art. With regard to point (2), clearly there are differences between what is disclosed in Nishi and what is recited in claim 29 of the application, in particular Nishi is silent on the possibility of "redirecting means for redirecting a protection portion of the multi-wavelength optical signal comprising protection portions of each

Appl. No. 10/697,312

of the optical signals around the dedicated switching fabric portion; a tunable optical filter coupled to the redirecting means for wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of a particular optical signal which would have been affected by the failure” as recited in claim 1. With regard to point (3), Applicant submits that Nishi should be considered as one who has a skill level that is at least that of one skilled in the art. Nishi discloses eleven different embodiments in the application, but none of them are as claimed in amended claim 29, in particular “redirecting means for redirecting around the dedicated switching fabric portion a protection portion of the multi-wavelength optical signal comprising protection portions of each of the optical signals; a tunable optical filter coupled to the redirecting means for wavelength filtering the protection portion of the multi-wavelength optical signal to obtain the protection portion of a particular optical signal which would have been affected by the failure”. Applicant submits that if it was obvious to allow all of the protection portions to pass through the switching fabric and make the selection of a desired protection portion after the switching fabric, Nishi would have at least suggested this possibility, considering that Nishi would be considered as one skilled in the art.

Taking into consideration the Graham factors as defined above, Applicant submits that due to differences in what is recited in the Nishi and what is claimed in the present application and since Nishi as one skilled in the art does not suggest or disclose what is recited in claim 29, Applicant submits that claim 29 is non-obvious with regard to and patentably distinguish over Nishi. It is submitted that the Examiner has failed to properly conform to the aforementioned guidelines for a finding of obviousness under 35 U.S.C. 103.

Applicant respectfully requests that the Examiner reconsider and withdraw the obviousness rejection of claims 1 to 6, 14 to 18 and 29.

Appl. No. 10/697,312

In view of the foregoing, early favourable consideration of this application is earnestly solicited.

Respectfully submitted,

ERIC BERNIER, ET AL

By


Elliott Simcoe

Reg. No. 50,010

Tel.: (613) 232-2486

Date: November 15, 2007

ESS:MSS:meg